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USSR Report

AGRICULTURE

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MEASURES FOR OBTAINING HIGH GRAIN YIELDS DISCUSSED

Moscow SEL'SKAYA ZHIZN' in Russian 23 Mar 84 p 1

/Article by V. Bondarenko, doctor of agricultural sciences and head of a laboratory at the All-Union Scientific Research Institute of Corn; I. Listopadov, doctor of agricultural sciences and head of a department at the Donskoye Scientific Research Institute of Agriculture; V. Medinets, doctor of agricultural sciences and chief of the Poltava inspectorate of the State Committee; A. Morozov, senior worker at the Scientific Research Institute of Agriculture of the TsRNChZ and B. Parshin, deputy chief of the Main Administration of the USSR Ministry of Agriculture: "Proper Tending of the Winter Crops"/

/Text/ Winter grain crops play an important role in the country's grain economy. And this is by no means an accident. In the majority of oblasts, they are considerably more productive than other grain crops. This is very clearly apparent during severe drought conditions. And our farming operations are subjected to drought conditions quite often.

Last year the sowing of winter crops was carried out mainly during the best periods and on a high agrotechnical level, with improvements being realized in the predecessor crop arrangements. Healthy seedlings appeared in the majority of the winter crop growing regions. The results obtained from growing these plants in monoliths revealed that the wintering of the winter crops turned out well in many zones. Thus all measures must be taken in the interest of realizing a maximum return from the winter fields.

A timely diagnosis of the status of the crops will make it possible to determine correctly the volume of spring work to be carried out in connection with tending the winter crops and to foresee the need for resowing or undersowing. This must be done as rapidly as possible, with use being made of the express methods recommended by science. A preference should be shown for the Donskoye method, based upon growth in the meristematic tissue. In addition to determining the number of viable plants, it also makes it possible to foresee their further development.

One effective method for raising the productivity of winter crops is that of applying a mineral fertilizer top dressing to the crops in the spring. This year, as never before, this requires the use of a creative approach by the agrochemical service. Routine performance in the carrying out of this work

cannot be tolerated. It must be differentiated depending upon the condition of the crops following the different predecessor arrangements, the degree of moisture in the soil, the peculiarities of the varieties, the time of resumption of spring growth and upon other factors.

First of all, a top dressing must be applied to crops which developed normally following non-fallow predecessor arrangements and which have an adequately dense stand of plants which were not fertilized in the autumn. Here the best results are obtained from a split application of mineral fertilizer. The first top dressing is carried out prior to the resumption of plant growth using aviation or ground equipment. The second -- during the phase of tillering and the commencement of shooting, with the fertilizer being placed at a depth of 3-5 centimeters using grain-fertilizer drills.

In applying the top dressings, consideration should be given to the mistakes of past years, when in a number of rayons and on well moistened and fertilized fields, especially during early resumption of growth, the farms applied top dressings to their crops using large dosages of nitrogen fertilizers. This resulted in the formation of an excessive amount of plant bulk, in lodging of the crops and, in the final analysis, in a reduction in cropping power. A top dressing is best given to such crops using the root method. In this instance, an increase takes place in the viability of the plants and in the density of the productive plant stand. Compared to a ground application, the increase in yield amounts to 2-5 quintals of grain per hectare.

Under existing conditions, the farm leaders and specialists must employ this agricultural method on a more extensive scale, especially on sowings of intensive varieties, which provide a high return for fertilizers applied.

Weakly developed winter crops should ideally be given a top dressing as early as possible. A local application of mineral fertilizer is not recommended for such crops, since this could lead to an additional thinning out of the crops and to a reduction in yield. The following condition must also be taken into account. If there is a deficit of moisture in the soil on which the crops are planted, the norm for applying mineral fertilizer should be reduced.

In the forest-steppe regions and the nonchernozem zone, the top dressing applied to fields which were not fertilized in the fall should ideally be carried out using complete mineral fertilizer. In the event of a late resumption of growth, the dosages of nitrogen fertilizer must be increased.

Commencing in the early spring, concern should be displayed for obtaining high quality grain. Root applications of complex fertilizers should be carried out on all sowings of strong and durum wheats and subsequently (during the heading and commencement of grain ripening phases, in accordance with the results of a soil and leaf diagnosis) -- a foliar application of urea.

Considerable importance is being attached this year to correctly singling out the weak, thinned out and damaged sowings on the farms. Scientific data and also extensive practical experience have established the fact that late ripening winter crops can furnish a satisfactory yield only if they wintered in a normal manner and the spring conditions are favorable. At the same time,

the capability of the winter crops to endure spring and summer drought conditions better than early spring crops requires the use of an intelligent approach when making a decision with regard to their resowing. In the case of an early resumption of spring growth, it is considered advisable to leave those sowings having a somewhat lower density of plant stand than usually recommended. Complete resowings should be carried out on severely thinned out sowings, the plant density of which is lower than the criteria adopted in each zone. Undersowings should be carried out on fields having irregular sparseness of stands.

Resowing work in behalf of winter crops should be carried out rapidly and in a high quality manner. This year, taking into account the prevailing conditions, a portion of the winter crops in the Ukraine, Moldavia and the north Caucasus should ideally be resown in grain corn. Adequate seed resources and also herbicides, toxic chemicals and fertilizers are available for this purpose.

For resowing in the steppe regions, it is recommended that pre-sowing cultivation of the soil be carried out using cultivators for extensive tilling and also sweeps and disk implements to the seed placement depth.

Under conditions involving an intensive build-up of temperatures and a rapid drying out of the soil, the resowing should be carried out using SZS-2.1 sowing machines without preliminary cultivation in the interest of ensuring healthy seedlings.

Fine results are obtained from undersowings of winter barley. The sowing norm is established in a manner so as to ensure that the overall number of plants per square meter, taking into account the remaining winter crops, does not exceed 500. Under this year's conditions, the crops should not be crowded, since this will lower the productivity of the winter grain crops. The seed placement depth must not be less than 4-6 centimeters.

One efficient method for tending the winter crops in the spring -- harrowing of the sowings. However, it is effective if it is carried out in a timely and high quality manner. First of all, the harrowing is carried out on normally developed and well bushed-out winter crops. Crops which have not bushed-out well are best cultivated using needle-shaped harrows of the BIG-3 type, in a passive position, or ring rollers. There is no need for employing this agricultural method on crops which were given a top dressing using the root method.

When harrowing winter crops it should be borne in mind that the secondary root system in a portion of the crops developed late and lies at a shallow depth. thus there is the danger of the plants sustaining damage. Consequently, proper thought must be given to the selection of the type harrow to be used and a campaign waged against weeds on such crops should ideally be carried out by treating them with herbicides in a timely manner.

During the spring, where there are alternating periods of cold snaps and warm weather, a portion of the sowings may suffer from heaving. At such times, the soil should be packed, with every attempt being made to prevent a drying out of the soil layer in which the tearing away of roots occurred.

Drenching of the winter crops can cause serious losses, especially in the northern oblasts of the nonchernozem zone where the crops are covered by a heavy layer of snow. Here ridging should be carried out to allow the thaw water to run off.

A shortfall in winter crop yields from partially thinned out plantings can be caused by their suppression by weeds. Weeds are destroyed most effectively in the spring using Group 2.4-D herbicides (amino salt and esters), with 2M-4KhM being employed on tracts having undersowings of leguminous grasses. Roughly 4-5 kilograms of ammonium nitrate or urea per hectare are added to the herbicides in the interest of raising their activity. The best period for applying herbicides -- during the tillering of the winter crops. The crops should be treated when the temperature is no lower than 12 degrees of heat.

During the autumn of last year, in the principal winter crop growing areas, the crops sustained severe damage caused by the grain beetle. The recommended system of chemical measures for combating this pest should be employed on such fields.

In combating brown rust, it is recommended that the sowings be treated with an 8 percent suspension of Sineb, at the rate of 50 liters of working solution per hectare.

In order to reduce the harm caused by root rots, the sowings should be treated with Fundozol in a dosage of 1-2 kilograms per hectare. This treatment should ideally be carried out together with the s.4-D herbicide.

In order to prevent the lodging of well developed plants and also in the case of early resumption of spring growth, the sowings should be sprayed with growth regulators: wheat -- chlorcholinechloride and rye -- Kampozan or a mixture containing it. Sowings of winter wheat should be treated towards the end of the plant tillering phase and at the beginning of the shooting stage and winter rye -- in the middle of the shooting stage. The growth regulator dosages are established based upon the existing recommendations for each zone.

It is known that many farms, just as soon as the dry weather appears, relax their concern for combating possible lodging of the plants, in the belief that the conditions are not suitable for lodging. And quite often they are wrong. The cholorsholinechloride preparation is effective in all years in which there is an early resumption of growth.

Special attention must be given to the cultivation of strong, valuable and durum winter wheats. In addition to ensuring proper care for these plantings, every attempt must be made to ensure that the maximum possible yields of high quality grain are obtained from each hectare.

In past years, the quality of the grain in a number of regions in the norther Caucasus and the Ukraine has deteriorated owing to damage caused by the chinch bug. The relatively moderate winter has increased the possibility of greater damage by this pest this year and thus a complete complex of measures aimed at protecting the plants must be carried out.

The agronomists must display a high degree of responsibility with regard to the seed sowings for winter crops. Special attention must be given to the sowings of valuable and promising varieties.

A high culture of farming and well thought out agricultural practices aimed at ensuring the timely and high quality carrying out of all work associated with tending the crops will serve to ensure the greatest care for the plantings and the production of high winter crop yields.

7026
CSO: 1824/305

MAJOR CROP PROGRESS AND WEATHER REPORTING

PREPARATION OF HIGH QUALITY SEED FOR SPRING SOWING

Moscow SEL'SKAYA ZHIZN' in Russian 22 Mar 84 p 1

/Agricultural review prepared by specialists attached to Sortsemprom of the USSR Ministry of Agriculture and the Editorial Board of the newspaper SEL'SKAYA ZHIZN': "High Quality Seed"/

/Text/ Spring sowing work is commencing throughout the country. One important factor for promoting an increase in the cropping power of the agricultural crops is that of high quality seed. The role played by such seed is especially important at the present time in view of the fact that the plant breeders have created highly productive varieties of the intensive type and the kolkhozes and sovkhozes have a powerful energy potential at their disposal for carrying out the work on a rapid basis.

Daily and purposeful work concerned with the cultivation, preparation and storage of seed is being carried out at many kolkhozes and sovkhozes. Roughly 91 percent of the seed placed in storage in the Ukrainian SSR meets the requirements for 1st class of the sowing standard, in the Belorussian SSR -- 87 percent, Bryansk Oblast -- 71, Belgorod Oblast -- 67, Voronezh Oblast -- 73 and in Penza Oblast 77 percent.

However, this is not the situation in all areas. Not all of the seed has been improved to sowing condition on farms in Kazakhstan. The work of preparing 1st class seed is being carried out in a completely unsatisfactory manner. In the Azerbaijan SSR, only 19 percent of the seed is 1st class, Estonian SSR -- 26, Rostov Oblast -- 18, Orel -- 15, Gorkiy Oblast -- 18 percent.

In the autumn of last year, the crop harvesting work was carried out during inclement weather in regions of the Urals and Siberia and thus the seed grain at a number of kolkhozes and sovkhozes still has a raised moisture content. Such seed, despite a high viability, possesses a lowered germinative energy and growth energy and this in the final analysis adversely affects the productivity of the crops.

The task of leaders and specialists on farms where such seed is available consists of organizing the processing of the seed in dryers having a moderate temperature regime and in storehouses with forced ventilation. An important agrotechnical method for raising the viable strength is that of air-thermal and solar warming. Thus a requirement exists at the present time for placing the

enclosed thrashing floors and asphalted areas in proper working order in order to take advantage of each good hour of time for working with the grain.

Recently, some improvements have taken place in the work of introducing new varieties and hybrids into production operations. This work was organized best in the Bashkir and Mordovian autonomous republics, in the Altay and Krasnodar krays and in Krasnodar, Belgorod, Tambov, Voronezh, Omsk, Kuybyshev, Kharkov and Kustanay oblasts. The production workers were assisted in this regard by the scientific institutes.

At the same time, strain changing work is proceeding in a very weak manner in many areas and the introduction of new varieties is being delayed for many years.

A number of varieties are being introduced into operations only slowly in Ryazan Oblast: Gorizont and Mirnyy oats, Kamskoye millet, L'govskaya-28 vetch and others. For a period of 4 years following regionalization, the areas set aside for Uladovskiy-10 peas amounted to only 200 hectares instead of the 60,000 called for in the plan. Personal responsibility has not been assigned for large batches of seed for new varieties at kolkhozes and sovkhozes in Georgia and Armenia. During this current sowing campaign, the agrochemical service, scientific research institutes and experimental stations are obligated to devote special attention to the use of seed for new varieties and to organize the work in a manner so as to ensure that fertilizer is applied in combination with the sowing work and that all of the agricultural methods required for a given variety are observed in a strict manner. It must not be forgotten that the more strict the observance of the technology for cultivating a variety, the higher will be its coefficient of propagation, the faster it will occupy the area called for in the regionalization and the sooner will be the repayment for the material resources required for its creation and introduction into production operations.

For mass production purposes, importance is attached to accelerating the propagation of newly regionalized varieties: Belorusskaya-80, Druzhina, Zhigulevskaya, Omskaya-12 and Kurganskaya-1 spring wheats; Pervenets, Cherkasskiy-240, Druzhba, Narymchanin, Kaskad and Odesskiy-10 spring barleys; Omskoye-10 millet; Kazanskaya Krupnozernaya and Astra buckwheat; Truzhenik peas and others which have produced fine results during state strain testing and in production sowings.

The leaders and specialists of kolkhozes, sovkhozes and agricultural and procurement organs must once again define more precisely the varietal structure for the strong and durum wheats, plant the crops in accordance with predecessor crop arrangements based upon the biological requirements of the variety and outline and carry out organizational and agrotechnical measures which will ensure fulfillment of the established tasks for procuring high quality grain. Work is presently being carried out in connection with inter-oblast and inter-republic shipments of seed grain. But in a number of areas the established tasks are not being fulfilled. This is the result of poor administration on the part of the procurement organs, where the seed grain is being improved only slowly to sowing condition and seed batches are being prepared for shipment in the same slow manner. Interruptions are taking place in the deliveries of

freight cars. Exchange operations among kolkhozes and sovkhozes in a number of oblasts in the Ukraine and Kazakhstan are being carried out in a very slow manner. This work is being held up in Orel, Lipetsk, Astrakhan, Novosibirsk and Chita oblasts. The agroindustrial associations must increase their exactingness with regard to the leaders and specialists of farms and grain receiving enterprises for the rapid completion of seed preparation work and the timely selection of the seed.

This year there has been a noticeable increase in the sowings of corn for grain. Compared to last year, the kolkhozes and sovkhozes have better hybrids at their disposal for the growing season. An improvement has taken place in their structure for grain sowing purposes. The areas for Kollektivnyy 101 TV, Kollektivnyy 210 ATV, Moldavskiy 330 M, Dneprovskiy 460 MV, Dneprovskiy 505 MV, Krasnodarskiy 362 TV and others will be expanded. The seed plants of Minzag /Ministry of Procurements/ have coped for the most part with the drying of the ears and many of them are preparing the seed and carrying out shipments to the destination points at a high tempo. However, there are also some shortcomings. For example, the Tyulkubas Corn Processing Plant in the Kazakh SSR shipped some batches of non-quality standardized corn seed, with documents indicating the seed to be of 3d class quality. The Panfilov Combine in this same republic tolerated incidents of corn seed being shipped in the absence of a check being made for sowing quality and in some batches the classification of the seed quality was inflated unjustifiably.

The country's kolkhozes and sovkhozes have been supplied fully with the seed required for oil-bearing crops. Many farms have 1st class material. In Voroshilovgrad, Donetsk, Dnepropetrovsk and Rostov oblasts and in Krasnodar and Stavropol krays, practically all of the sunflower seed meets the requirements for 1st class of the sowing standard and the grading of this seed for uniformity has been completed. Unfortunately, only 55 percent of the seed placed in storage in Sumy Oblast was improved to sowing condition, Penza -- 13, Orenburg -- 48, Cherkassy Oblast -- 39 percent.

Only a brief period of time remains prior to the commencement of sowing. Each batch of seed must be carefully examined and work must be organized aimed at improving its classification as to quality.

The services for the use of chemical processes and the agrochemical services of kolkhozes and sovkhozes in the forest-steppe and forest districts of the Ukraine, the TsChO /central black earth region/, the nonchernozem zone, Siberia, northern Kazakhstan, certain regions in Belorussia and a number of other areas must intensify in a decisive manner their work aimed at disinfecting the seed against smut. Not one hectare should be sown using untreated seed.

Time does not stand still. The preparation of the seed for the spring sowing work must be completed as rapidly as possible!

7026
CSO: 1824/305

MAJOR CROP PROGRESS AND WEATHER REPORTING

MOSCOW RADIO REPORTS AGRICULTURAL DEVELOPMENTS 21 MARCH-3 APRIL

21-22 Mar

LD230303 [Editorial Report] The following is a compilation of reports on agricultural developments in the USSR broadcast by Moscow Domestic Service in Russian on 21 and 22 March. Times of broadcasts are given in parentheses at the end of each item.

21 March

The traditional spring festival is being marked in Uzbekistan today. It coincides with the start of mass field work. Planting of early vegetables is now in full swing. In the south, where the sun rays are already warming the soil, the machine operators have gone to the fields; in a short time they will finish sowing lucerne, corn and other feed crops. Some 2 million ha have been earmarked this year for cotton, the republic's main crop. (0304 GMT)

The first machines have been taken to the fields in Gorkiy Oblast. Sowing of perennial grasses has started. (0500 GMT)

Tillage of winter crop tracts and sowing of early spring crops have been fully completed in the southern rayons of Rostov. (0500 GMT)

Chuvash ASSR pilots have started top-dressing winter grain crops and perennial grasses. (0500 GMT)

22 March

Collective and state farms of the Mari Non-chernozem zone have completed formation of sowing complexes and links. Seventy-two percent of the entire sowing area has been assigned to contracting collectives. This year there will be a considerable increase in the area sown to feed root crops and zoned varieties of grain crops. (0304 GMT)

Kurgan Oblast farms have started pre-sowing preparation of seeds. In the complicated weather conditions of last autumn many collective and state farms laid in less seeds than usual. Moreover, individual batches of grain had increased

humidity. Timely heating with hot air and sunlight will make it possible to improve its sowing qualities. For this purpose the seeds are being ventilated in the grain stores, are being taken out onto special asphalted yards and are being treated with chemical preparations. (0304 GMT)

Farms of Severnaya Osetiya have started field work. (0304 GMT)

Sowing of oats, barley and maize has begun in all of Georgia's lowland areas. (0500 GMT)

Kazakhstan rural workers are making use of the late arrival of spring to increase the application of fertilizer to the fields: 30 million tons of organic fertilizer has already been applied. (1630 GMT)

Kursk Oblast agricultural workers aim to sell to the state at least 1.5 million tons of grain. (1630 GMT)

Dnepropetrovsk combine works today dispatched the 15,000th self-propelled sugar beet-harvesting combine since the start of the 5-year plan. Production is being increased of beet loaders which are in short supply. (1630 GMT)

Uzbekistan: cotton sowing has begun. The pledge is to sell at least 6 million tons of raw cotton to the state this year. (2330 GMT)

24-25 Mar

LD260058 [Editorial Report] The following is a compilation of reports on agricultural developments in the USSR broadcast by Moscow Domestic Service in Russian on 24 and 25 March. Times of broadcasts are given in parentheses at the end of each item.

24 March

Cotton sowing has begun in Uzbekistan. (0200 GMT)

Over 500,000 ha are to be sown to early spring crops in Kursk Oblast. All 520 sowing complexes are ready to be taken out onto the fields. Meanwhile aircraft and ground equipment are top dressing the winter grain crops, taking into account the humidity of the soil. Top dressing has been carried out on over 200,000 ha. (0304 GMT)

Alfalfa sown in a rayon of Tashkent Oblast in just 20 working hours. (0900 GMT)

Northern Ossetia begins selective sowing of feed crops. (0900 GMT)

Farms of the Crimea, having completed sowing of early spring crops, are preparing soil for vegetables and other later crops. Particular attention is being given to maize. (1200 GMT)

Aviators of Kazakhstan have today completed feeding winter crops in southern areas, on 450,000 ha. (1200 GMT)

A large seed-farming zone has been created in the west of Chu Valley in Kirgizia. Water from an underground sea has given life to the formerly arid areas of the Aspara Wastes. Today hydro-geologists handed over an automated system of deep wells for use by peasants, farmers (?), almost 1 month ahead of plan. It can provide water to 1,500 ha of fields of the new virginlands state farm of Kelechek, from which every year hundreds of metric tons of seeds will be sent to sugar beet growers of the Russian Federation and other republics of the country. (1200 GMT)

Kabardo-Balkar farmers have begun sowing early spring crops almost 10 days later than usual. (1400 GMT)

Inspite of bad weather Kazakhstan airmen have completed top-dressing of winter crops in southern oblasts of the republic on an area of 450,000 ha at the optimal time. (1400 GMT)

Snow still lies on Altay fields but many rayons are ready for sowing. (1400 GMT)

Crimean farmers having ended sowing of early spring crops are preparing soil now for vegetables and maize. (1850 GMT)

One hundred thousand hectares have been planted to grain in Uzbekstan. (1900 GMT)

Potato planting started in north Ossetia. (1900 GMT)

25 March

New maize seeds have been dispatched to Kazakh farmers. (0500 GMT)

Field work continued in many parts of the country today following a short spell of colder weather. Fieldwork is in progress in the central Asian republics and individual areas of the North Caucasus and the Ukraine, where there has been precipitation in the last few days. This precipitation has swelled moisture reserves. Machine operators must now take steps to retain this moisture. Work has now been completed on over 4 million ha. Sowing of early crops, mainly feed crops, is also in progress. (0700 GMT)

In Georgia top-dressing of winter wheat from the air has begun. Almost one-third of the republic's cereal area is now treated by aircraft. (0800 GMT)

26-27 Mar

LD280153 [Editorial Report] The following is a compilation of reports on agricultural developments in the USSR carried by Moscow Domestic Service in Russian on 26-27 March. Times of broadcasts are given in parentheses at the end of each item.

26 March

A feed concentrates works has become operational in Yuzhno-Sakhalinsk. In terms of equipment and production capacity it has no predecessor west of Urals. Its

daily capacity is 630 t, or 230,000 t of loose and pelletized feed a year. It is to achieve the design capacity within a year but the collective is hoping to reach the level before then. (0001 GMT)

Tomsk Oblast machine operators have all their sowing and cultivating equipment ready for spring work. They pledge higher production than last year. (0100 GMT)

27 March

Alma-Ata TASS correspondent says Kazakh farmers have prepared grain and pulse crop seeds for spring sowing. (0100 GMT)

Northern Rostov Oblast has begun sowing; sowing is nearly over in the south. Altogether nearly one-third of the sowing has already been completed. (0300 GMT)

First thousands of hectares have been sown to grain in Kirghiziya. (0304 GMT)

Minsk Oblast farmers prepare sowing and cultivating machines a month earlier than last year. (0500 GMT)

Orel Oblast: fertilization of fields under way. (0700 GMT)

Rayons in the north of Rostov Oblast have begun sowing spring crops. In the south, early sowing has been completed at many farms and work is in hand on corn and sunflower planting. Over 2 million ha will be planted to spring crops in the Don area this year. About one-third of this has already been seeded. (0800 GMT)

Armenian crop farmers have completed planting of early potatoes. In the Ararat Valley, the main zone for the cultivation of this crop, it covers 1,500 ha. The republic's specialized farms plan to produce over 2,000 t of early potatoes this year, considerably more than in 1983. (2204 GMT)

The low-productive foothills of the Ukrainian Carpathians is becoming a zone of programmed high yields. Specialists of the oblast agro-industrial associations have presented the farms with agro-chemical certificates compiled for each field. The crop farmers will use them during spring field work and during the subsequent tending of the plants. The introduction of scientifically founded system of crop farming will make it possible to bring the yield of grain crops up to 30 quintals from each ha of breadgrain land in Prikarpartye. (2004 GMT)

Winter crops taking up more than 1 million ha in Saratov Oblast. (2105 GMT)

28-29 Mar

LD310340 [Editorial Report] The following is a compilation of reports on agricultural developments in the USSR carried by Moscow Domestic Service in Russian on 28-29 March. Times of broadcasts are given in parentheses at the end of each item.

28 March

Spring work began in Dnepropetrovsk Oblast in the middle of March. Spring work is underway in Kurgan Oblast, where there is good weather. Last autumn, many farms

did not manage to lay in sufficient seeds, and about a million quintals of seed grain is being imported into the oblast from other areas. (0900 GMT)

Issyk-Kul Oblast in Kirghizia: farmers began sowing. (1200 GMT)

Early spring crops have been sown on 100,000 ha in the south of Kazakhstan. At present, sowing units are in operation in the republic on the fields of Chimkent, Dzhambul, Alma-Ata, and Kzyl-Orda oblasts. Altogether 29 million ha of arable land are to be sown to spring crops in the republic this spring. (2050 GMT)

Mass sowing of corn has started in Turkmenia. This year this crop will cover some 40,000 ha of irrigated lands, mainly in the Karaku, Canal Zone. This year it is planned to sow four-fifths of the areas according to the industrial technology. (2050 GMT)

29 March

In Uzbekistan, following the southern oblasts, the farms in the Fergana have begun to sow cotton. (0304 GMT)

Petrovskiy Rayon in Stavropolskiy Kray reports completion of sowing. Other rayons are working well. (0500 GMT)

Leninabad is the first Tajik Oblast to start sowing corn. (0500 GMT)

Kazakhstan has completed the winter's field work. The last tractors with snow ploughs have left the fields in the northern oblasts of the republic. Hundreds of farms overfulfilled the plan for snow retention work. Specialists think that a good stock of winter moisture has been accumulated in the northern oblasts of Kazakhstan. (0700 GMT)

Mass grain sowing started in Astrakhan Oblast today. (0900 GMT)

Altay Kray is to sell 3.7 million metric tons of grain to the state this year, including 1.5 million metric tons of strong and valuable wheat. (1630 GMT)

30-31 Mar

LD311326 [Editorial Report] The following is a compilation of reports on agricultural developments in the USSR carried by Moscow Domestic Service in Russian on 30-31 March. Times of broadcasts are given in parentheses at the end of each item.

30 March

Potato planting has started in the southern Kirghiz SSR. (0700 GMT)

In Kazakhstan top-dressing of winter grain crops with mineral fertilizers has been completed on 1.5 million hectares. (0800 GMT)

Spring sowing is under way in 10 union republics. Spring crops have been sown on almost 3 million hectares including the area resown to replace those damaged during the winter. In the Kuban and Crimea work has been completed on sowing early crops. Mass sowing has begun in the ASSR's of the Northern Caucasus, in Rostov Oblast, in the southern Ukraine and Kazakhstan. Field work is beginning on the lower Volga. To preserve soil moisture, mass harrowing, cultivation, and leveling have been carried out on over 6 million hectares. (0900 GMT)

Sowing of sugar beets, early grain, and pulses started in Moldavia today. Ten union republics have now begun sowing spring crops. In the subtropics of Azerbaijan the first harvest is being brought in. (1100 GMT)

Taldy-Kurgan Oblast in Kazakhstan has begun spring field work. Perennial grasses and barley are being sown. (1330 GMT)

Spring fieldwork has begun almost 3 weeks late in Uzbekistan. The conditions are extremely difficult. Farmers have to prepare the soil for sowing and sow feed crops, spring grain, corn, and cotton--virtually all at the same time. Most farms have completed the sowing of lucerne. Almost 2 million hectares in the republic are to be sown to cotton, the main agricultural crop. Sowing is in progress on many farms in Surkhandarya and Kashkadarya Oblasts. Other oblasts will start sowing at any moment. (1600 GMT)

In Dnepropetrovsk Oblast today was warm and sunny. In the southern and central areas of the oblast, the crop growers have started to sow barley, oats, and peas. (1630 GMT)

The sowing of early grain crops has begun in the Priamurye. The cropgrowers have decided to carry it out in 100-120 working hours. (1630 GMT)

Mass sowing of summer crops has begun in Kiliya Rayon, the southernmost in Odessa Oblast. (1630 GMT)

Having completed the sowing of early summer crops, the cropgrowers of Ipatovskiy Rayon are among the first in Stavropol Kray to prepare the ground for corn and sunflowers. Great care is also taken of the winter crops, where the introduction of mineral fertilizers has begun. (1630 GMT)

Pre-sowing watering of the cotton plantations is in progress on the Turkmen SSR Kuybysheva Kolkhoz. (1630 GMT)

Another oblast, Taldy-Kurgan, has begun spring fieldwork. Sowing comes later than usual here, because of the delayed spring. Work is, therefore, to be carried out around the block. (1850 GMT)

Sowing of early crops has begun in the Amur zone. (2004 GMT)

Eleven union republics are already sowing spring crops. Taking into account the repair to winter-sown crops, nearly 3 million hectares have been sown to spring crops. Moisture retention work prior to sowing has been done on over 6 million hectares. (2230 GMT)

31 March

Early grain crop sowing has commenced in the Khabarovsk Kray. (0500 GMT)

Rice planting has started in the southern Uzbek SSR. (0500 GMT)

Planting of sugar beets was started today in the Kuban, to cover 200,000 hectares in the kray. (0500 GMT)

31 Mar-1 Apr

LD020318 [Editorial Report] The following is a compilation of reports on agricultural developments in the USSR carried by Moscow Domestic Service in Russian on 31 March-1 April. Times of broadcasts are given in parentheses at the end of each item.

31 March

More than 6 million roots of sugar beets is to be dispatched for processing this year by the crop growers of the Kuban. The sowing of that crop began today in most farms of the Kray. They have to carry out sowing on an area of 200,000 ha. On half of that area, the sugar beets will be grown on the basis of industrial technology, by mechanized links with collective contracts. (1500 GMT)

The crop growers of Kazakhstan sowed winter cereals in the autumn on an area of more than 2 million hectares. The feeding of mineral fertilizers into 1.5 million hectares of that area has been completed. (1500 GMT)

Spring field work has begun in the south of the Ukraine. Warm weather was slow to arrive this year in these areas. The areas under summer crops were considerably expanded because of this year's autumn and winter. The machine operators therefore have to compress further the harsh timetables of spring field work. Early grain crops are sown almost simultaneously with feed crops and sugar beets. (2005 GMT)

1 April

New strains of grain and feed crops developed by the Altay Scientific Research Institute for Agriculture and the selection of agricultural crops are to be planted this spring over a great area in Altay. They include the Altayka--a new strain of hard wheat--which is mid-season maturing and well suited to Siberian conditions. In yield, it is much better than the Kharkovskaya-46 and Almaz hard wheats. Sowings of this strain are to be almost doubled. (0000 GMT)

Mass sowing of spring cereal crops is in progress in Kirghizia. Winter cereal crops are currently being tended and top-dressed with mineral fertilizer. Sowing of spring wheat and barley has begun. These crops will occupy over 250,000 ha. Spring has arrived very late this year. (0200 GMT)

The farms of the Khabarovsk Kray have started their spring sowing work. (0400 GMT)

Sowing of rice has commenced in the south of Uzbekistan. (0400 GMT)

Ukraine: Field work proceeds apace, with almost double the amount of corn sown this year. Southern Brest Oblast farmers have begun work: spring crops will occupy over 3 million ha in Belorussia. (0900 GMT)

The struggle for the winter crop is being waged in the Kuban. This spring is a difficult one for the Kuban's farmers. But thanks to grain-growers' [word indistinct] and efforts, supplementary sowing and resowing of fields with early spring crops has been completed on the total area of 320,000 ha. (1500 GMT)

Cotton will be sown on over 500,000 ha in Turkmenia. Seed-laying is to be completed in 10-12 days. Some 6,000 metric tons more of seeds against the plan have been produced. (1800 GMT)

A solemn meeting devoted to the anniversary of the start of opening up virgin lands has been held in Tomsk; 170,000 ha of new land was opened up there which allowed grain and vegetable output to be doubled and potato production to be quintupled. (1950 GMT)

2-3 Apr

LD040345 [Editorial Report] The following is a compilation of reports on agricultural developments in the USSR carried by Moscow Domestic Service in Russian on 2-3 April. Times of broadcasts are given in parentheses at the end of each item.

2 April

Kurgan Oblast farmers have begun top-dressing of crops and perennial grasses. (0200 GMT)

More than 3 million hectares will be taken up [word indistinct] spring crops in Belorussia. The farms of the southwestern rayons of Brest Oblast have been the first in the republic to start spring field work. (0204 GMT)

Farms in the southern rayons of Moldavia have started sowing leguminous and pulse crops; seeds are being prepared for beet sowing in the north. (0400 GMT)

Rostov Oblast: spring crops have been sown on 1 million ha, approximately half of the spring-crop area. (1000 GMT)

Sowing of summer crops and perennial grasses is coming to a close in the active cultivation zones in Osh and Talas oblasts and in the Chu Valley. Kirgiz land cultivators have pledged to produce 1,485,000 metric tons of grain and to obtain no less than 35 qu of cereals, 60 qu of corn for grain, 28.5 qu of cotton, and no less than 22 qu of tobacco leaf per each irrigated hectare, in 1984. (1330 GMT)

Sowing of winter crops in Stavropol Oblast is being completed on 500,000 ha. (1750 GMT)

3 April

Sugar-beet sowing is in progress in the southern part of Kazakhstan. (0000 GMT)

Early crops have been sown over an area of 1 million hectares by today in Rostov Oblast. This is about half the area given over to spring crops. In the south, the first shoots are being seen. (0204 GMT)

Surkhandar'ya Oblast in Uzbekistan is today completing sowing of corn for grain. (0204 GMT)

Sowing has started in Belorussia. Twelve union republics are now engaged in sowing. (0330 GMT)

Field work and spring sowing is in full spate on the Don. (1100 GMT)

Five rayons out of 19 are sowing grain crops in south Kazakhstan. Some 370,000 ha have been sown. Forty percent of the area allotted to spring grain has already been sown in Dzhambul Oblast. (1500 GMT)

A plenum of the state commission for varieties and testing of agricultural crops has ended its work in Moscow today. Over 200 new varieties were proposed for regional testing in various areas. Their main characteristics are enhanced yields, suitability for industrial cultivation, and resistance to disease. Agricultural production is receiving new varieties of rye designed for growing both in the European part of the country and in Siberia. They are short-stemmed varieties, answering the most up-to-date requirements. There is noticeable increase in the varieties of strong, valuable, and hard wheats which have high grain qualities. They are intended for food purposes. Enhanced quality of grain also distinguishes a series of varieties of groat crops. Tests have been successfully conducted on new numerous varieties of feed crops: these are lupin, soya, annual, and perennial grasses. A new variety, Tritikal, has also been added for production. It is hybrid of rye and wheat. (1530 GMT)

Vegetable planting is in progress in Tuva a week earlier than usual, despite the cold spring. There will be 800 ha of hot-house cultivation in the republic this year. (1530 GMT)

Agricultural pilots are leaving Omsk for top-dressing crops in Belorussia. (1630 GMT)

CSO: 1824/338

MAJOR CROP PROGRESS AND WEATHER REPORTING

MOSCOW RADIO REPORTS AGRICULTURAL DEVELOPMENTS 4-11 APRIL

4-7 April

LD080309 [Editorial Report] The following is a compilation of reports on agricultural developments in the USSR broadcast by Moscow Domestic Service in Russian on 4-7 April. Times of broadcasts are given in parentheses at the end of each item.

4 April

In Odessa Oblast the sowing of early spring crops is nearing completion on the total area, which is almost 500,000 hectares. (2000 GMT)

5 April

In Uzbekistan cotton has been sown on the first 100,000 hectares. (0800 GMT)

In the stepped of Stavropol Kray today machine operators completed sowing spring crops: together with winter crops they occupy almost 2 million hectares. (1000 GMT)

Sowing has begun in southern Belorussia, Kazakhstan, and Moldavia, making 12 union republics now engaged in sowing. In the RSFSR spring crops now occupy over 2 million hectares, with almost 900,000 hectares of this in the Don region. Sowing is going on in the southern Volga region, while harrowing is getting under way in the central Chernozem and southern Nonchernozem regions. The situation on winter crops has improved considerably, helped by good topdressing on over 20 million hectares. In the Kuban all sowing of early pulses has been completed and work is now underway on sowing row crops, primarily sugar beet--which will be cultivated on over 200,000 hectares, more than 1/2 of this using industrial methods. In the southern part of Volgograd Oblast harrowing is in progress, and where conditions permit the earliest crop of all--mustard--is being sown. It is planned to sow 1.8 million hectares to early grain this year. Moisture reserves are very low, and so there must not be the slightest delay in preparing the soil and sowing. A further 30,000 hectares of irrigated land is to be created this year alone in Volgograd Oblast. (1100 GMT)

6 April

In southern Belorussia mass sowing of spring crops has begun. In conditions of a shortage of moisture front-ranking farms have managed to complete sowing early grain crops in 40-50 hours. (0200 GMT)

In the southern areas of Kharkov Oblast the sowing of early cereals began today. The spring this year has made farmers' work difficult: they have to resow 1/5 of the winter crop area, which suffered from drought, and immediately begin carrying out moisture retention. In Kursk Oblast sowing has also begun: Belovskiy, Oboyanskiy and Sudzhanskiy Rayons are carrying out selective sowing of barley and oats. (0400 GMT)

Ukrainian farm workers have completed sowing spring crops on the first million hectares. Most oblasts in the republic have now started on spring field work. (1400 GMT)

In the southeast Belogorod Oblast mass sowing of barley and peas has begun. Due to weather conditions last autumn and winter, nearly 1/3 of all winter-sown crops require resowing. (1800 GMT)

7 April

In Azerbaijan sowing of cotton has begun. It will be sown on an area of 300,000 hectares. The spring campaign in the republic has been somewhat delayed by rainy weather. (0400 GMT)

In southern Tula Oblast machine operators have started harrowing. This moisture retention work will be carried out in 46 working hours by 520 links working according to the collective contracting method, which will take care of over 1/2 of the entire sowing area. In the Altay the handing out of maps [kartoskhemy] for the spring sowing period has started at Kolkhozes and Sovkhozes. The maps specify the structure for siting crops on the basis of scientifically-based zone cropping systems, as well as the technology for tilling the soil. In order to cultivate grain crops, sugar beets and fodder crops 2,000 self-planning teams and links have been set up, and payment for work in these collectives will be conducted on the basis of the harvest gathered. (1100 GMT)

On the Shirak Steppe in Armenia the sowing of grain has begun. Taldy-Kurgan Oblast in Kazakhstan has begun sowing sugar beets on 303,000 hectares. (1750 GMT)

8-11 April

LD120253 [Editorial Report] The following is a compilation of reports on agricultural developments in the USSR broadcast by Moscow Domestic Service in Russian on 8-11 April. Times of broadcasts are given in parentheses at the end of each item.

8 April

Twelve republics are now engaged in sowing spring crops. In the RSFSR the sowing of spring crops is underway on 4 million hectares. A correspondent in Rostov on Don reports that all 42 rayons there are busy with field work. This year spring crops occupy more than 2 million hectares, and to date more than 1/2 of spring sowing work has been done. (0600 GMT)

In the Ukraine the mass sowing of sugar beets is underway. Cotton is being sown in Uzbekistan: In Kirghiziya 100,000 hectares have been sown to date. (0800 GMT)

In the southern rayons of Tambov Oblast the first spring work has begun; the harrowing of autumn ploughland and sowing of perennial grasses. Tambov Oblast has pledged 1.11 million tons of grain this year. (2300 GMT)

9 April

Kuban farmers have sown spring crops on 700,000 hectares and begun field work in the sunflower fields. In Kursk Oblast moisture-covering of ploughland and harrowing of perenial grasses is being completed. (0400 GMT)

In the Chechen Ingushetiya autonomous republic the sowing of early spring crops has been completed in the autonomous republic. Also, mass sowing of sugar beets, potatoes and vegetables has started, and, in spite of difficult weather conditions, work is proceeding at a good rate. In southern rayons of Penza Oblast farmers have started spring field work. Moisture retention work is a priority. In the Vaksh Valley, Tajikistan, vigorous shoots have appeared in early-sown cotton plantations; and inter-row tilling will start soon. Machine operators in the most southern rayons of Tajikistan have begun the first cutting of lucerne, which occupies over 110,000 hectares in the republic. (1530 GMT)

10 April

In Belgorod Oblast early cereals have been planted on over 100,000 hectares. In Osh Oblast, Kirghiziya, cotton sowing has begun. (0600 GMT)

In Rostov Oblast sowing of ear and leguminous crops is nearing completion. One point seven million hectares have been sown of the total of 2 million. Vigorous shoots of barley and peas have appeared in the southern areas. (1100 GMT)

In Orlov Oblast sowing has begun, while in Udmurtia sowing brigades have been formed. (23 GMT)

11 April

In Nikolayev Oblast early cereals have been sown on 250,000 hectares. In Karakalpakia cotton sowing has begun and in Kirghizia mass sugar beet sowing has begun. (1530 GMT)

In Belgorod Oblast the sowing of sugar beets is underway. (1800 GMT)

CSO: 1824/355

MAJOR CROP PROGRESS AND WEATHER REPORTING

SUGAR BEET PROCESSING FIGURES REPORTED

LD061142 Moscow TASS in English 1131 GMT 6 Feb 84

[Text] Moscow, 6 Feb (TASS)--The processing of sugar beet, one last activity begun in the autumn harvesting season, has come to an end. [A total] of 12.4 million tonnes of sugar has been produced, which is more than last year. To give one an idea of the scale of this sector, suffice it to say that the yearly sugar production in the world is put at about 100 million tonnes.

Sugar beet is the principal raw material for this sector in the USSR. The sugar beet is grown each year at an area of 3.5 million hectares. Increasing the yield of this root-plant is the chief way to increase sugar production. Knowing this, the cooperative and state farms are actively introducing advanced techniques for growing the sugar beet. Last year industrial technology was used at one half of the country's plantations. Availability of specialized machinery, fertilizer, plant protection chemicals and high-yield seed varieties will make possible to apply industrial technology on 2 million hectares.

To make a more effective use of the opportunities available, the workers of the cooperative and state farms are now using their time to maximum advantage. The mechanics learn to operate new machinery at specialized courses, while agronomists learn the methods for growing new high-yield varieties of sugar beet. The farms are amassing fertilizer and plant protection chemicals.

The sugar industry also gets raw materials from Cuba in the form of sugar cane. Sugar factories--numbering over a hundred in the USSR--are preparing to process a large quantity of raw materials. New shops are being built and the existing ones are being expanded to increase by 10 thousand tonnes the daily quantity of sugar beet processed.

CSO: 1824/312

MAJOR CROP PROGRESS AND WEATHER REPORTING

BRIEFS

BELGORODSKAYA OBLAST SUGAR BEET DEVELOPMENTS--Remarks by the chairman of the Belgorodskaya Oblast executive committee in the February edition of a regional agricultural journal throw some light on sugar beet crop developments in that oblast. Belgorodskaya Oblast, with 16 percent of the agricultural land assets in the Central Chernozem Zone produces 28.5 percent of the sugar beets from that region. Gross production in 1981 and 1982 exceeded 2,310,000 tons and stood at 3,525,400 tons in 1983. The 1983 sugar beet procurement figure, 3,353,000 tons is 25 percent above the average for the 10th Five-Year Plan. [Summary] [Krasnodar SEL'SKIYE ZORI in Russian No 2 Feb 84 pp 4, 6, 13; Moscow TASS in Russian 23 Oct 83]

UKRAINE SUGAR BEET DEVELOPMENTS--In Ternopol'skaya Oblast sugar beets for industrial processing are cultivated in all 16 rayons on an area of 122,000 hectares, 14 percent of the crop rotation structure. In 1982 sales to the state amounted to 72 percent of the plan. Sugar content in the 11th Five-Year Plan, set at 14.9 percent, has amounted in fact to 15.98 percent. [Summary] [Moscow ZAKUPKI SEL'SKOKHOZYAYSTVENNYKH PRODUKTOV in Russian No 11 Nov 83 p 16] Vinnitskaya Oblast has the largest area in the Ukrainesugar beets--over 220,000 hectares. Sugar beet sales to the state, which ave amounted to 5,500,000 tons per years, reached 6,600,000 tons in 1983 and should amount to no less than 7,000,000 tons in 1984. Sugar beet yields should amount to 340 quintals per hectares in 1984. [Summary] [Kiev SIL'S'KI VISTI in Ukrainian 3 Feb 84 p 2; Moscow SEL'SKAYA ZHIZN' in Russian 31 Jan 84 p 1] COPYRIGHT: "Zakupki sel'skokhozyaystvennykh produktov", 1983 "Sel'skiye zori", 1984

CSO: 1824/312

UDC 63:66

PROSPECTS FOR USE OF CHEMICALS IN GRAIN CROP DEVELOPMENT

Moscow KHIMIYA V SEL'SKOM KHOZYAYSTVE in Russian No 6, Jun 83 pp 3-9

/Article by Candidate of Agricultural Sciences L. M. Derzhavin, Central Institute of Agrochemical Services for Agriculture: "Chemicalization in USSR Grain Farming"/

/Text/ An increase in grain production is the key problem of the country's agriculture. The average production of grain should total 238 to 243 million tons during the 11th Five-Year Plan and from 250 to 255 million tons during the 12th Five-Year Plan, as compared to 205 million tons during the 10th Five-Year Plan.

By 1990 the yield of grain crops is to be raised to 21 or 22 quintals per hectare, that is, during the decade it is to be increased by 6 to 7 quintals per hectare with an annual increment of 60 to 70 kg per hectare. During the period from 1966 through 1980 the average annual increment in the yield of grain crops totaled 38 kg per hectare and during the 11th and 12th Year Plans it is to be almost doubled.

The quality of grain should also be improved and the production of the grain of wheat of durum and strong varieties, winter rye, brewing varieties of barley, buckwheat and pulse crops, as well as fodder grain (barley, oats and corn), should be increased.

An increase in the yield of these crops requires the intensification of grain farming, that is, overall scientifically substantiated application of fertilizers and agents for the protection of plants against pests, diseases and weeds; irrigation in combination with a high level of agrotechnology.

Our country's agriculture is managed under extremely unfavorable natural and climatic conditions. About 60 percent of the arable land is in regions with an average annual temperature of +5°C (for comparison: in the United States such land comprises 10.3 percent). Only 1.1 percent of the arable land in the USSR is in regions with an annual amount of precipitation of 700 mm and more (in the United States, 60 percent) and about 40 percent of the arable land is in regions with an annual amount of precipitation of up to 400 mm (in the United States, 11 percent).

With due regard for weather conditions the biological potential of agricultural land in the USSR, according to the estimates of specialists at the Council for the Evaluation of Productive Forces under the USSR Gosplan, is lower by a factor of 2.4 than in the United States. In connection with this a stable growth of the yield of agricultural crops in our country is closely connected with the satisfaction of the needs of plants for nutrients. At the same time, the results of agrochemical inspection of soil indicate that sizable areas of arable land in the USSR have agrochemical properties unfavorable for the cultivation of grain crops. As of 1 January 1982 the arable area with a very low, low and average content of mobile phosphorus exceeds 167 million hectares (77 percent) and with such a low content of exchange potassium, 72 million hectares (33.2 percent); 54 million hectares require liming. About 24 million hectares of arable land are represented by solonets soil requiring gypsuming or reclamation cultivation. More than 80 million hectares of arable land are characterized by a low content of humus (less than 2 percent). In a number of the country's regions there is a shortage of magnesium, sulphur and trace elements in soil, which also hampers the production of high and stable harvests of grain crops.

The results of generalization of the data on mass field experiments of the agrochemical service conducted directly on kolkhoz and sovkhoz fields have shown that no less than one-fourth of the grain harvest in our country is created owing to the application of fertilizers (table).

On soddy-podzolic soil in the Ukraine and Belorussia the share of mineral fertilizers in the harvest of winter rye reaches 43 to 45 percent (increment in the grain harvest totaling 105 to 10.8 quintals per hectare from the application of $N_{90}P_{75}K_{75}$). The application of mineral fertilizers under these conditions makes it possible to obtain 38.76 to 41.20 rubles of net income per hectare of sown area. On gray forest soil and podzolized chernozem in the Ukraine the increment in the harvest of winter rye with the application of $N_{80}P_{75}K_{60}$ totals 10.2 quintals per hectare, or 39.4 percent (net income, 39.99 rubles per hectare).

At the same time, according to the results of generalization of 65 experiments the utilization of mineral fertilizers at the rate of $N_{75}P_{75}K_{60}$ for winter rye on dark-gray forest soil and podzolized and leached chernozem in the Cis-Ural Province made it possible to increase the yield of grain by only 4.8 quintals per hectare (16.1 percent). The application of mineral fertilizers under these conditions was unprofitable. The total expenditures connected with their application exceeded the value of additional output by 2.61 rubles per hectare.

The utilization of mineral fertilizers for winter wheat is profitable in all the regions of its cultivation. The highest return on mineral fertilizers is observed on soddy-podzolic soil in the Central Russian Province, the Ukraine and Belorussia, where the increments in the harvest of grain with the application of $N_{100}P_{80}K_{80}$ total 10.9 to 12.7 quintals per hectare (36.4 to 39.9 percent) with a net income of 23.27 to 35.48 rubles per hectare.

Efficiency of Application of Mineral Fertilizers to Grain Crops

(1) Зона (число опытов)	(2) Прибавка урожая от удобрений, ц/га	(3) Долевое участие удобрений в урожае, %	(4) Долевое участие видов удобрений в прибавке урожая			(5) Чистый доход, руб.	
			(6) азотные	(7) фосфорные	(8) калийные	(9) на 1 га посева	(10) на 1 руб. затрат
(11) *Озимая рожь*							
(12) Южнотаежно-лесная (556)	6,4—10,8	29,5—44,9	38,2—56,3	21,9—41,3	15,3—31,9	6,48—41,20	0,13—0,78
Лесостепная (299) (13)	4,8—10,2	23,0—39,4	32,9—40,3	28,9—47,4	15,8—30,8	from —2,61 to +39,99	from —0,06 to +0,82
(14) *Озимая пшеница*							
(12) Южнотаежно-лесная (318)	10,9—12,7	36,4—39,9	48,7—58,2	23,4—25,1	18,3—26,2	23,27—35,48	0,41—0,61
Лесостепная (938) (13)	7,1—8,6	20,3—27,9	38,9—45,0	29,6—45,9	13,8—26,8	5,01—12,69	0,10—0,28
Степная (734) (14)	4,9—7,9	15,6—23,2	35,9—42,2	45,3—54,6	6,6—14,0	5,15—8,42	0,10—0,20
Сухостепная (97) (15)	5,4	15,1	28,5	71,5	—	10,61	0,36
Горные природно-сельскохозяйственные области, Кавказская горная область (138) (16)	8,3—10,5	31,3—36,2	45,9—63,0	27,5—49,2	9,5—19,6	14,30—27,12	0,31—0,054
(17) *Яровая пшеница*							
(12) Южнотаежно-лесная (168)	7,5—7,7	33,8—35,7	40,4—46,0	31,9—39,4	20,2—22,8	0,76—2,13	0,01—0,04
Лесостепная (1130) (13)	3,3—11,1	14,6—38,5	33,0—76,4	11,8—56,3	7,9—24,3	from —13,23 to +31,77	from —0,35 to +0,62
Степная (294) (14)	1,9—4,2	10,6—19,1	14,2—33,3	44,4—59,5	13,4—26,3	from —3,14 to +7,89	from —0,16 to +0,62
Сухостепная (140) (15)	2,2	18,2	36,4	45,4	18,2	—5,00	—0,44
Горные природно-сельскохозяйственные области, Южно-Сибирская провинция (18)	4,6	16,9	58,6	20,7	20,7	—3,37	—0,11
(19) *Яровой ячмень*							
Среднетаежная (35) (20)	12,9	50,8	52,8	30,7	16,5	15,85	0,30
Южнотаежно-лесная (400) (12)	9,4—12,3	35,2—36,6	50,2—52,9	24,2—27,8	19,3—23,6	from —1,16 to +11,95	from —0,02 to +22
Лесостепная (367) (13)	6,3—9,4	22,6—29,8	40,0—50,8	31,9—39,4	9,8—26,8	from —10,27 to +1,81	from —0,23 to +0,04
Степная (236) (14)	3,2—6,7	15,5—23,1	33,4—40,5	40,5—47,5	16,4—23,8	from —17,53 to 1,21	from —0,51 to 0,03
Полупустынная, при орошении (11) (21)	9,3	30,8	51,1	48,9	—	7,14	0,17
(22) *Кукуруза на зерно*							
Лесостепная (122) (13)	11,7—15,3	25,9—28,1	36,1—47,0	33,3—40,1	17,1—25,8	36,19—62,64	0,59—0,97
Степная (281) (14)	6,5—9,1	17,0—20,1	37,9—62,5	37,5—47,6	7,7—15,3	7,18—36,88	0,15—0,95
Горные природно-сельскохозяйственные области, Карпатская горная область (45) (23)	20,0	38,1	48,1	29,7	22,2	93,19	1,28
Кустарниково-степная и сухолесная (35) (24)	8,3	26,0	22,9	51,8	25,3	23,30	0,51
Предгорная пустынностепная, при орошении (33) (25)	15,7	26,0	39,0	28,0	33,0	53,97	0,71

/Key on following page/

Key:

1. Zone (number of experiments)
2. Harvest increment from fertilizers, quintals per hectare
3. Share of fertilizers in harvest, %
4. Share of types of fertilizers in harvest increment
5. Net income, rubles
6. Nitrogen
7. Phosphorus
8. Potassium
9. Per hectare of sown area
10. Per ruble of expenditures
11. Winter rye
12. Central taiga-forest
13. Forest steppe
14. Steppe
15. Dry steppe
16. Natural-agricultural mountain regions, Caucasian Mountain Region
17. Spring wheat
18. Natural-agricultural mountain regions, South Siberian Province
19. Spring barley
20. Central taiga
21. Semidesert, with irrigation
22. Corn for silage
23. Natural-agricultural mountain regions, Carpathian Mountain Region
24. Shrub-steppe and dry-forest
25. Piedmont desert-steppe, with irrigation

Spring wheat also positively responds to the application of mineral fertilizers in all the regions of its cultivation, although the increments in the harvest of this crop are lower than those of winter grain crops. The biggest increments in the harvest from fertilizers are observed on light gray and gray forest soil in the West Siberian Province (11.1 quintals per hectare from $N_{90}P_{75}K_{40}$ with a net income of 31.17 rubles per hectare) and on soddy-podzolic, light gray and gray forest soil in the Central Russian Province, where harvest increments reach 7.1 to 7.7 quintals per hectare with a net income of 2.13 to 6.57 rubles per hectare. On soddy-calcareous soil in the Central Siberian Province, typical chernozem in the Central Russian Province, leached and typical chernozem in the Cis-Ural Province, leached chernozem in the Cis-Altay and South Siberian provinces, southern chernozem of the Trans-Volga Province and dark chestnut soil in the Trans-Volga and Kazakhstan provinces the expenditures connected with the application of mineral fertilizers exceed the value of the harvest increment obtained from them.

Spring barley responds to the application of mineral fertilizers more strongly than spring wheat. Grain harvest increments reach 12.9 quintals per hectare (50.8 percent) on soddy-podzolic soil in the European Province and the Central taiga zone and 9.4 to 12.3 quintals per hectare (35.2 to 36.6 percent) on soddy-podzolic soil in the southern taiga forest zone. In the forest steppe zone harvest increments total 6.3 to 9.4 quintals per hectare (22.6 to 29.8 percent) and in the steppe zone, from 3.2 to 6.7 quintals per hectare (15.5 to 23.1 percent). With irrigation on light chestnut soil in the Central Kazakhstan Province the grain harvest increment from the application of mineral fertilizers at the rate of $N_{60}P_{90}$ totals 9.3 quintals per hectare (30.8 percent) with a net income of 7.14 rubles per hectare.

An excess of the expenditures on the application of fertilizers over the value of the additional spring barley harvest obtained from them is observed in the Central Russian and Cis-Ural provinces of the forest-steppe zone and the steppe zone.

The highest increments in the corn grain harvest are observed in the forest steppe zone, that is, 11.7 to 15.3 quintals per hectare (25.9 to 28.1 percent), in the steppe zone, 6.5 to 9.1 quintals per hectare (17.0 to 20.1 percent), in the Carpathian Mountain Region, 20 quintals per hectare (26 percent) and with irrigation on ordinary serozem in the South Kazakhstan Piedmont Province, 15.7 quintals per hectare (26 percent). The minimum increment in the corn grain harvest, that is, 6.5 quintals per hectare (17 percent), is observed on ordinary chernozem in the steppe zone of the Ukraine.

Depending on the amount of the harvest increment and cultivation regions the net income from the application of mineral fertilizers to corn for grain ranges within 23.30 to 93.19 rubles per hectare of sown area. In all the country's regions the application of mineral fertilizers to this crop is profitable economically.

The effectiveness of application of individual types of mineral fertilizers also changes depending on the soil and agrochemical conditions and regions of cultivation of grain crops. For example, on soddy-podzolic soil in the southern taiga-forest zone increments in the winter rye harvest at the rate of 38.2 to 56.3 percent are due to the effect of nitrogen fertilizers, 21.9 to 41.3 percent, of phosphorus fertilizers and 15.3 to 31.9 percent, of potassium fertilizers. For winter wheat these indicators are 41.8 to 58.2, 23.4 to 25.1 and 18.3 to 26.2 percent respectively.

In the forest-steppe zone the share of nitrogen in the formation of the harvest increment decreases slightly, but the role of phosphorus fertilizers increases. The share of nitrogen in the formation of the increment in the winter rye harvest in this zone comprises 32.9 to 40.3 percent, of phosphorus, from 28.9 to 47.4 percent and of potassium, from 15.8 to 30.8 percent; for winter wheat, 38.9 to 45.9, 29.6 to 45.9 and 13.8 to 26.8 percent respectively.

In the steppe zone the effect of nitrogen is even weaker, the role of phosphorus increases, but the role of potassium fertilizers decreases. The share of nitrogen fertilizers in the increment in the winter wheat harvest is 35.9 to 42.2 percent, of phosphorus fertilizers, from 45.3 to 54.6 percent and of potassium fertilizers, from 6.6 to 14 percent.

On chestnut soil in the dry-steppe zone the share of nitrogen in the increment in the winter wheat harvest comprises 28.5 percent and of phosphorus, 71.5 percent and in the Caucasian Mountain Region the share of nitrogen comprises 45.9 to 63 percent and of phosphorus, from 34.5 to 49.2 percent. The share of nitrogen in the increment in the spring wheat harvest on soddy-podzolic soil in the European part of the southern taiga-forest zone comprises 40.4 to 46.0 percent, of phosphorus, from 31.9 to 39.4 percent and of potassium, from 20.2 to 22.8 percent; in the forest-steppe zone of the European part of the USSR, 33.0 to 43.6, 34.2 to 43.8 and 19.2 to 2.43 percent and in the steppe zone of the European part of the USSR, 33.3, 44.4 to 53.3 and 13.4 to 22.3 percent respectively.

In the steppe regions of Kazakhstan phosphorus fertilizers have the greatest effect on the yield of spring wheat and on gray forest and light gray forest soil in West Siberia 70 percent of the harvest increment is due to nitrogen

fertilizers. On gray forest soil in the Central Siberian Province the share of nitrogen in the harvest increment comprises 76.4 percent and phosphorus and potassium account for 11.8 percent each.

The effect of nitrogen fertilizers on the yield of barley is manifested more strongly on soddy-podzolic soil in central taiga and southern taiga zones--from 50.2 to 52.9 percent. The share of phosphorus in the formation of the harvest increment in this zone comprises from 24.2 to 30.7 percent and of potassium, from 16.5 to 19.3 percent. In the forest steppe zone the share of nitrogen comprises 40 to 50.8 percent, of phosphorus, from 31.9 to 39.4 percent and of potassium, from 9.8 to 26.8 percent; in the steppe zone, 33.4 to 40.5, 40.5 to 47.5 and 16.4 to 23.8 percent respectively. In the semidesert zone the share of nitrogen is 51.1 percent and of phosphorus, 48.9 percent.

A weakened effect of nitrogen and potassium and an intensified role of phosphorus in the direction from the north to the south and from the west to the east is observed in the formation of increments in the harvest of all grain crops.

The field experiments of the agrochemical service have shown that the yield of grain crops and the effectiveness of mineral fertilizers are in close connection with agrochemical soil indicators. For example, in the European part of the USSR, when the content of mobile phosphorus in soil was increased from 20-40 mg/kg (by Kirsanov's and Chirikov's methods) to 120-180 mg/kg, the yield of grain crops rose by 5 to 7.7 quintals per hectare. An increment in the content of mobile phosphorus in soil from low (50 mg/kg) to average (51 to 100 mg/kg) increases the yield of grain crops by 4 to 6 quintals per hectare and from average to higher (101 to 150 mg/kg), by 2 to 4 quintals per hectare.

The role of phosphorus increases in arid regions. For example, when the content of mobile phosphorus increases by 1 mg in 1 kg of soil, the increment in the winter wheat harvest is 3.8 to 4.4 kg in the forest steppe zone of the Ukrainian Province, 6 kg in the Central Russian Province and 14.5 kg in the more arid steppe zone of the Ukrainian Province.

The positive role of phosphorus in the fight of plants against drought has also been established. For example, in the steppe zone of the Ukraine with a content of 65 mg of mobile phosphorus in 1 kg of soil the yield of winter wheat during years unfavorable in terms of moisture decreased by 38 percent and with 120 mg/kg, by 23 percent. Similar results have also been obtained in the country's other regions subjected to droughts.

The positive role of potassium in an increase in the yield of grain crops is manifested to a greater extent on peat bogs and light-texture soil. An increase of 50 mg in the content of exchange potassium in 1 kg of this soil raises the yield of grain crops by 3 to 4 quintals per hectare and on loamy soil, by 1.5 to 2.5 quintals per hectare.

The yield of grain crops and the effectiveness of application of fertilizers to them depend on the reaction of the soil solution. Winter wheat (optimum pH value, 6.3 to 7.6), spring wheat (6.0 to 7.5), barley (6.8 to 7.5), corn (6.0 to 7.0), peas (6.0 to 7.0) and soybeans (6.5 to 7.1) are most sensitive to soil acidity.

An increase in pH per unit in the range of 4.5 to 5.5 raises the yield of winter wheat and barley by 5 to 7 quintals per hectare (by 40 to 50 percent) and in the pH interval of 5.5 to 6.5, by 2 to 3 quintals per hectare (25 to 30 percent). On soddy-podzolic soil in Belorussia and in the Ukraine the yield of spring barley on control plots (without fertilizer application) totaled 12 quintals per hectare (with a content of 60 to 75 mg/kg of mobile phosphorus and exchange potassium in it and pH of 4.6 to 4.8), or 25 to 30 quintals per hectare (with a content of 120 mg/kg of phosphorus and potassium and pH of 5.2 to 5.4) and with a content of 140 to 150 mg/kg of phosphorus and potassium in soil and pH of 6.1 and more the yield of barley exceeded 35 quintals per hectare.

On soddy-podzolic soil in the central region of the nonchernozem zone with a content of 50 mg/kg of phosphorus and potassium in it and pH of 4.5 the yield of winter wheat of the Mironovskaya 808 variety is 11.9 quintals per hectare and with a content of 150 mg/kg of phosphorus and potassium and pH of 5.5 the yield reaches 29.4 quintals per hectare. The effectiveness of application of fertilizers to crops most sensitive to soil acidity after the liming of acid soil increases 1.5- to 2-fold.

On the basis of the results of generalization of the experimental data of the agrochemical service a positive connection between the yield of grain crops and the content of humus in soil in nonchernozem, forest-steppe and steppe zones has also been established.

Many examples attesting to the production of high and stable harvests of grain crops under production conditions in the country's various zones (on farms where there is constant concern for the preservation and increase in soil fertility) can be cited. However, on state strain testing plots the yield of grain crops throughout the country, on the average, is higher by a factor of 1.8 to 1.9 than under production conditions.

An especially big difference in the yield (two- to threefold) is observed in the North-West, Central, Volgo-Vyatka, Ural and East-Siberian economic regions of the RSFSR and the smallest difference, in Uzbekistan (19 percent) and Moldavia (28 percent). The existing gap in the yield of grain crops on farms and state strain testing plots encompassing all basic zones (including arid) points to the big potentials in the increase in the yield and gross output of grain in the country.

In 1985 the delivery of mineral fertilizers for grain crops should be increased by no less than 1.7-fold, as compared with 1980, and in 1990 it should be doubled. At the same time, during the decade the return on their application should be increased by 12 to 15 percent.

To ensure the envisaged increment in the yield of grain crops and to improve the quality of grain, every farm must master the scientifically substantiated farming system as applied to specific natural and economic conditions and an efficient application of organic and mineral fertilizers, chemical ameliorants, agents for the protection of plants against pests, diseases and weeds, retardants and other chemicalization agents, observe production discipline, perform

all field operations in a quality manner and at the optimum time, introduce highly productive, new varieties and hybrids and strictly fulfill the recommendations for an overall application of chemical agents.

It is necessary to eliminate above-standard physical losses of mineral fertilizers during their transportation and storage, which, according to the estimates of the Central Institute of Agrochemical Services for Agriculture, will make it possible to additionally obtain about 6 million tons of grain, and to organize a strict accounting of the intake and expenditure of fertilizers on every farm by fields (plots) and crops. Observance on farms of the recommended doses and ratios of mineral fertilizers will increase their effectiveness by 10 to 15 percent and a uniform application of mineral fertilizers (20 to 25 percent of nonuniformity instead of 50 to 70 percent in practice) will increase their effectiveness by no less than 10 percent.

Special attention should be paid to a scientifically substantiated topdressing of grain crops, for which it is necessary to widely utilize an overall diagnosis (plant and soil diagnosis in combination with meteorological data) of the nutrition of agricultural crops during the period of their vegetation. Overall diagnosis should be applied primarily on areas sown with winter grain crops for the establishment of the doses and periods of nitrogen topdressing. A production check has shown that with the introduction of diagnostic methods the effectiveness of the nitrogen topdressing of winter crops increases by 15 to 20 percent and the content of crude gluten in grain rises by 3 to 6 percent. In 1983 the topdressing of winter crops based on diagnostic results should be carried out on an area of no less than 13 million hectares throughout the country.

An increase in the application of organic fertilizers up to 1.2 billion tons in 1985 and 1.5 billion tons in 1990 (as compared to 834 million tons in 1984) is a significant potential for the further growth of grain production. Every ton of these fertilizers contributes to a rise of 0.5 quintals of grain units in the yield of all rotating crops.

In regions with negligible reserves of trace elements in soil the application of appropriate microfertilizers will make it possible to increase the yield of grain crops by 2 quintals per hectare and more. Boric, copper and molybdenum microfertilizers are the basic types of these fertilizers in the North-West, Central and Ural economic regions of the RSFSR, the Ukraine, Belorussia and the Baltic Area and zinc and manganese microfertilizers, in the North Caucasus and Volga economic regions of the RSFSR, Kazakhstan and Central Asian Union Republics.

The introduction into production of a local application of full doses of mineral fertilizers simultaneously with sowing ensuring an increase of 2 to 3 quintals of the grain harvest per hectare deserves much attention.

The application of granulated superphosphate or granulated ammophos, nitroammophoska and nitrophos during sowing in the dose of 20 kg of P_2O_5 per hectare increases the yield of grain crops by 2 to 3 quintals per hectare and more. This method is especially effective in arid steppe regions on soil with an insufficient content of mobile phosphorus, that is, Kazakhstan, Siberia, the Volga Area, the steppe zone of the Ukraine and so forth.

An overall utilization of fertilizers, retardants and agents for the protection of plants against pests, diseases and weeds is a necessary condition for an increase in the yield of grain crops. A scientifically substantiated application of these agents requires a prompt forecasting of the manifestation of pests, diseases and weedy vegetation. In 1981 the agrochemical service together with farm specialists began mass inspections of sown areas for weediness. Weediness maps compiled on the basis of the results of these inspections make it possible to approach in a differentiated manner the doses for the expenditure of herbicides and to determine the need for them depending on the number and specific composition of weeds.

Throughout the country the average and heavy weediness (more than 15 weeds per square meter) of areas sown with winter rye comprised 55 percent of the inspected area, with winter wheat, 50.2 percent, with spring wheat, 64.4 percent, with barley, 60.7 percent, with oats, 51.8 percent and with corn for grain, 47.2 percent. Investigations show that, even when the weediness of sown areas is weak, weeds remove up to 70 kg of nutrients per hectare, that is, as much as necessary for the production of 1 ton of commodity grain with due regard for side output and, when weediness is heavy, up to 200 kg of nutrients.

In addition to the removal of nutrients weeds take away water from agricultural crops and thereby aggravate the harmful effect of drought, as well as shade plants, lowering the coefficient of utilization of solar energy and weakening photosynthesis. Therefore, before applying fertilizers, fields must be maximally clear of weeds.

Fields with a low level of soil fertility subject to overall agrochemical cultivation by means of a combined application (where this is needed) of organic and mineral fertilizers (including microfertilizers), ameliorants, retardants, herbicides and other chemicalization agents, as well as the performance, when needed, of amelioration operations should be the main areas of weed control. Overall agrochemical cultivation should ensure a deficit-free humus balance and an increase in nutrient reserves available for plants.

On the basis of the results of generalization of experimental and production data the following values of agrochemical soil indicators optimal for the growth of agricultural crops have been established: The content of mobile phosphorus (according to Kirsanov) on soddy-podzolic soil totals 100 to 150 mg/kg in field grain-grass rotation, 150 to 250 mg/kg in field grain-row crop rotation and 250 to 300 mg/kg in vegetable crop rotation. The content of exchange potassium should be 120 to 170, 170 to 250 and 250 to 300 mg/kg respectively. On typical, leached, podzolied and ordinary chernozem the optimal content of mobile phosphorus (according to Chirikov) totals 150 to 200 mg/kg in field grain fallow rotation, 150 to 250 mg/kg in field grain row crop rotation and 250 to 300 mg/kg in vegetable crop rotation and of exchange potassium, 100 to 150, 150 to 200 and 250 to 300 mg/kg respectively. In field crop rotations on Azov and Cis-Caucasian chernozem and chestnut soil the optimum content of mobile phosphorus (according to Machigin) should be 20 to 30 mg/kg and of exchange potassium, 200 to 300 and 300 to 400 mg/kg respectively.

To maintain a deficit-free humus balance on soddy-podzolic sandy and sandy loam soil, the application of 50 tons of manure per hectare every 3 to 4 years is recommended, on loamy and clay soil, 60 tons per hectare every 5 to 6 years, on gray forest sandy and sandy loam soil, 40 tons per hectare every 3 to 4 years respectively, on clay and loamy soil, 50 tons per hectare every 5 to 6 years, on chernozem (on the average), 40 tons per hectare every 4 to 5 years and on chestnut soil, 30 tons per hectare every 3 to 4 years.

All the work on an overall application of chemical agents, including with the agrochemical cultivation of low-fertility soil, is done in accordance with planning estimates. The fertilizer system is developed for crop rotation with an annual correction of application rates with due regard for the planned harvest, fertilizer stocks, results of plant diagnosis, the actual and planned content of nutrients in soil and fertilizer expenditures for an increase in the content of nutrients in soil per unit.

To increase the content of mobile phosphorus per mg in 1 kg of soil, it is necessary to apply 5 to 12 kg of P_2O_5 and exchange potassium--from 4 to 10 kg of K_2O. Fertilizer rates are calculated on the basis of their expenditures per harvest unit (harvest increment), the removal of nutrients by the planned harvest and coefficients of replacement of fertilizer removal. These indicators are developed by chemicalization stations and appropriate scientific institutions on the basis of the results of generalization of the data on field experiments with fertilizers for every specific soil and climatic zone.

Chemical soil reclamation is carried out on the basis of standard and zonal recommendations. Acid soil is limed according to norms complete in terms of hydrolytic acidity. Herbicides are applied in accordance with weediness maps.

Planning estimates envisage the implementation of measures for environmental protection against contamination with agrochemicals and their residues and state and author's control over the quality and prompt performance of work in strict accordance with planning estimates and other technological documents.

In 1981-1985 planning estimates for an overall application of chemicalization agents should be prepared essentially for all the country's farms. To perform this work, provision is made for the further expansion of the volumes of agrochemical inspection of soil in agricultural areas, that is, shortening the cyclical nature of inspections to 3 years with irrigation and to 5 years on nonirrigated land, increasing the determined indicators from 7 to 23, expanding experiments with fertilizers, introducing plant diagnosis of agricultural crop nutrition and evaluating the quality of fertilizers and other chemicalization agents. The technical reequipment of planning-research stations for the chemicalization of agriculture with instruments and machinery will make it possible to increase the productivity of analytical work 1.5- to 2-fold during the current five-year plan.

The agrochemical regionalization and certification of fields is to be completed during the 11th Five-Year Plan. An overall program for an increase in soil fertility for the 11th Five-Year Plan and for a long-term period should be developed on every farm. Chemicalization stations should annually determine the economic effectiveness of application of mineral fertilizers and other chemicalization agents for all farms in the service zone.

The automated information computer system of management of agrochemical services (AIVSU-Sel'khozkhimiya), which is a subsystem of the automated system of management of agriculture (ASU-sel'khoz), is introduced for an efficient management of the chemicalization of agricultural production.

The Central Institute of Agrochemical Services for Agriculture has developed and introduces into production program complexes making it possible to carry out the following by means of computers: calculations for the determination of the need for mineral fertilizers and for the distribution of their stocks at various levels of management; preparation of recommendation plans and planning estimates for the application of organic and mineral fertilizers (including microfertilizers), as well as chemical ameliorants; determination of the economic effectiveness of fertilizers under production conditions; generalization of the results of agrochemical soil inspection; development of standards for fertilizer application. Optimization by means of computers of the plans for the application of fertilizers, mineral feed additives and other chemicalization agents and their introduction into production make it possible to increase the effectiveness of utilization of chemical agents by 10 to 15 percent.

Three forms of agrochemical production services for kolkhozes and sovkhozes function in the country: State (rayon and interrayon Sel'khozkhimiya associations); state-cooperative (interfarm chemicalization centers and agrochemical associations); farm (kolkhoz and sovkhoz chemicalization centers and fertility detachments).

The selection of the forms of organization of agrochemical services is determined by natural-economic conditions, sizes of farms, the level of application of chemical agents and other conditions.

The state form of agrochemical services envisages the fulfullment of work on chemicalization directly by Sel'khozkhimiya production associations.

In regions with an extensive application of chemicalization agents, where large and economically strong farms well equipped with machinery predominate, economic chemicalization centers are developed on a priority basis.

The economic efficiency of various forms of agrochemical services should be determined by a system of indicators, of which the following are basic: gross output, yield, recovery of chemicalization agents with additional output, labor productivity and cost of work.

The further development of economic interrelations and of material incentives for the workers of Sel'khozkhimiya associations for the end results of work is the main problem in the improvement in agrochemical services. The economic interrelations of rayon (interrayon) Sel'khozkhimiya production associations with kolkhozes, sovkhozes and other agricultural enterprises should be built on mutual interest in the attainment of high end results.

The further improvement in the technology of grain production and extensive utilization of chemicalization agents in the cultivation of grain crops with due regard for specific natural-economic conditions will make it possible to

attain the goals in the development of the country's grain farming outlined by the May Plenum (1982) of the CPSU Central Committee and to sharply increase the return on the agrochemicals utilized in agriculture.

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PROBLEMS OF PROTECTION, PROCUREMENT OF BAYKAL AREA TIMBER

Moscow SEL'SKAYA ZHIZN' in Russian 21 Mar 84 p 4

/Article by M. Babintsev (SEL'SKAYA ZHIZN' correspondent), the Buryat ASSR: "What Baykal Forest Murmurs About"/

/Text/ The forest near Baykal impresses with its wealth. On the territory of Buryatia alone it stretches over 27 million hectares, of which almost one-half is in the zone of the Siberian Sea. In Irkutsk Oblast green forest tracts are even bigger. Not every country in the world has such a storeroom of nature! Are forests really only timber?... Several dozens of state timber industry establishments in the autonomous republic and the Angara Area are engaged in the procurement of furs, berries, mushrooms and medicinal grass.

The green worker, accumulating moisture, gives birth to springs and rivers and kills dry winds. It is also a powerful natural filter, owing to which most Siberian cities now do not feel the influx of industrial smog. Finally, what perhaps is the most important, forest is beauty, a sense of great life.

Outside the window there was hot, dusty summer. Ivan Innokent'yevich Myasnikov, an old forest ranger from the Kudunskiy Forestry Farm, was distressed, shaking his snow-white head:

"How many years has it been dry!... Young pine trees on the hillocks are burnt. Yesterday I walked along the grove and, when I touched the lower dead twigs of the beautiful pines, my heart ached."

Myasnikov has lived in the green cordon for 40 years. As soon as he returned from the front with splinters in his leg, he undertook the troublesome farm. He grew up there and remembers, when he was a boy, how truly "dense and unknown" the local taiga was. The brooks that revive only in spring were then full murmuring rivers, where the grayling and lenok abounded. Now the darkness of the dense forest can be seen only in the distant ravine, to which as yet there are no roads. However, every year the technical equipment of timber procurers becomes more powerful and Ivan Innokent'yevich fears that they will also reach these remote corners in the near future.

For many decades the Trans-Baykal forest was felled along the Trans-Siberian Trunk Line and near big floatable rivers. The interest focused only on how to deliver timber more rapidly and cheaply. Anything that was near was taken and cutting was done not selectively, but in succession, in big square lots.

The disappearance of numerous springs and rivers, which have replenished the Siberian Sea, is the main loss. Hence the frequent fall in its level and the often recurring droughts in the Trans-Baykal Area in the last few years. Such a drop pattern has been demonstrated by the Institute of Forestry and Timber of the Siberian Department of the USSR Academy of Sciences. It is well known that until the 70th year of its growth the coniferous forest consumes all the moisture from the earth for itself and only later, after gathering strength, it begins to give it back for the birth of springs. Today many of those pines, cedars and larches that have risen at the place of old fellings and at vitally important water arteries are not even 40 years old. Some people are convinced that Baykal's restricted green zone is a narrow strip along its shore. However, specialists assure us with authority that the mark should proceed from the watershed, from the places where rivers originate. Incidentally, a well-reasoned and scientifically substantiated search for specific measures for the preservation of Baykal should begin from here.

A number of important party and government decrees on measures for an efficient utilization and preservation of Baykal's natural complexes have been adopted beginning in the 1960's. A great deal has been done during this time. All the forests forming part of the basin have been classified with plantings with a special utilization regime and mountain soil and water protective forest tracts, steppe pine forests and green zones of health resorts and reservations have been placed under strict control and, basically, are not subject to felling. A new technique of timber procurement, the so-called narrow strip method, which makes it possible to preserve up to 70 percent of the young coniferous trees, has been introduced. A year ago the volumes of timber procurement were lowered by almost ½ million cubic meters for the autonomous republic. New forestry farms were established.

"There is no doubt that the attitude toward our forest, mainly Baykal's green zone, has changed," M. A. Shapkin, Buryat ASSR deputy minister of forestry, told me. "However, we must still do a great deal, striving for a planned nature and order in fellings and for efficiency in the restoration of the Trans-Baykal taiga. It annually loses 40,000 hectares of its land, not counting those ravished by fires during drought years."

Mikhail Arkad'yevich's anxiety is quite understandable. More than 350 enterprises are engaged in timber procurement on the territory of the autonomous republic. Whereas the timber industry establishments of the Zabaykalles Association and of the republic's Ministry of the Fuel Industry adhere to the new procurement technology to some extent, small consumers, as before, fell trees indiscriminately. The number of forestry farms, which basically ensure protection and plantings after fellings, is fewer and fewer. Well, does the coefficient of their effect on the increase in forest resources grow? No. Under the guise of sanitary fellings with the consent of the RSFSR Ministry of Forestry timber procurement volumes are annually increased for these forestry farms. In Buryatia's Ministry of Forestry in the last 5 years they have increased by 20,000 cubic meters. At times forest rangers face the following dilemma: To engage in forest regeneration or to fulfill the procurement plan?

It must be admitted that green cordons have not yet become true taiga protectors everywhere. For example, the Gorkhonskiy Timber Industry Establishment, which for a year has been engaged in felling in excess of the calculated cutting, that is, more than the set limit, but the forestry farm does not initiate a suit. The yeravninskiy Forestry Farm does not control timber procurers at all. It also happens that forest protectors become powerless before the directive received from above, as has happened on the Kizhinginskiy Forestry Farm recently. On the table of its director there is a paper notifying that the forest tracts of the Leonovskoye Forestry Area have been transferred from the first to the second group, that is, they are subject to felling. But 30,000 hectares of this land are located on the slopes of Khamar-Daban, where the watershed is and from where rivers originate. Here forests are represented mainly by young cedars, which give commercial cones. A. I. Loskutnikov, secretary of the Kizhinginskiy Rayon Party Committee, knocked on many doors of the republic's Ministry of Forestry and demanded that the decision be changed, but the officials made a helpless gesture, saying that, according to the statute, the forests were subject to felling.

Vast forest tracts are located in the BAM /Baykal-Amur Trunk Line/ zone on Baykal's northern shore. We will build the trunk line of the century and along with it cities and settlements. However, together with the new construction the beauty of nature must remain--primordial, not touched by coarse hands. To this day the managers of the Nizhneangarsk Transstroy Trust of the BAMtonnel'stroy Administration consider such views naive. How is it possible to build a road and not touch the taiga!... You can't make an omelet without breaking the eggs... Trampled islands and rides in the forest, hundreds of built roads that no one needs and land mutilated by open pits and ravines, like scars, remain along the entire route. A year ago the Ministry of Forestry instituted a 1 million ruble suit against BAM enterprises, but they did not pay a fine.

What measures are necessary to make people not forget that they must have a careful attitude toward Trans-Baykal nature? An efficient utilization of timber and, as a result, a decrease in fellings are the first and most important. The following fact makes one think: At conferences the managers of the timber processing enterprises of the Zabaykalles Association often boast of a complete utilization of timber. In the last few years the achievements have been noticeable here. However, why do forest timber industry establishments, which to this day leave 15 to 20 percent of the timber on plots, not fight for the affirmation of such a valuable initiative!

However, if this can be considered natural waste, this is legalized barbarity and again on the part of the Ministry of Forestry. Every year the workers of its forestry farms are engaged in thirning out the young coniferous forest, that is, simply selective felling, and burn (burn!...) 70,000 cubic meters--in the language of procurers--of small-scale commodity timber, even though there is a special mobile machine capable of producing industrial chips from thin-stem trees. As yet, however, neither the Onokhoy Timber Industry Combine, nor the Selenginsk Pulp and Cardboard Combine, has found time to adapt the technology for the utilization of incidental raw materials.

Twenty forest organizing expeditions, which made calculations and prepared plans, were sent to Buryatia at one time. However, the forest continues to be felled on the same plots, with the same assignments and at times with their considerable overfulfillment. The economic flywheel put into operation continues to turn at the same speed. Therefore, it is urgent for the USSR State Committee for Forestry to once again send its forest organizing expeditions of authoritative specialists to Baykal and to reexamine the raw material base. The interests of this cause demand that its main points be located beyond the zone of the Siberian Sea, not in it.

The Trans-Baykal taiga is hospitable in its own way and beautiful at any time of the year.

However, the taiga is also a storeroom, whose services man cannot yet refuse. Thus, let us take exactly what it can give, without infringing on the main thing--continuation of its life, which is interconnected with everything that surround us: mountains, rivers, our famous Baykal and the entire living world populating them.

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